

Patent claims

1. A heating, ventilating or air-conditioning system having a housing in which, if appropriate, at least one
5 heat exchanger such as a heating element and/or vaporizer is accommodated, for the purpose of conditioning the air, having a blower with at least one air duct for feeding preferably conditioned air to an air outflow vent, and having at least one air outflow
10 vent from which air streams out preferably into a passenger compartment of a vehicle, the outflow characteristic of the air outflow vent being adjustable in a controllable fashion between a first characteristic with a scatter character and a second
15 characteristic with a spot character.

2. The heating, ventilating or air-conditioning system as claimed in claim 1, characterized in that the outflow characteristic can be varied by means of a
20 settable swirl.

3. The heating, ventilating or air-conditioning system as claimed in claim 1 or 2, characterized in that the swirl of the at least one air stream can be
25 set between a maximum value for the scatter characteristic and a minimum value for the spot characteristic.

4. The heating, ventilating or air-conditioning
30 system as claimed in one of the preceding claims, characterized in that the outflow characteristic can be set or open-loop controlled or closed-loop controlled as a function of at least one parameter and/or at least one operating state.

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5. The heating, ventilating or air-conditioning system as claimed in one of the preceding claims, characterized in that the outflow characteristic can be

open-loop controlled, closed-loop controlled or set as a function of at least one parameter as a deviation from a setpoint value or as a difference from a setpoint value.

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6. The heating, ventilating or air-conditioning system as claimed in one of the preceding claims, characterized in that the outflow characteristic can be open-loop controlled, closed-loop controlled or set as
10 a function of a parameter field or characteristic diagram of a plurality of parameters.

7. The heating, ventilating or air-conditioning system as claimed in one of the preceding claims,
15 characterized in that a parameter P is a variable of the passenger compartment temperature, the solar radiation, the external temperature, the speed of the vehicle or a time parameter.

20 8. The heating, ventilating or air-conditioning system as claimed in one of the preceding claims, characterized in that the outflow characteristic can be set to spot character when there is a first deviation of the actual value from a setpoint value.

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9. The heating, ventilating or air-conditioning system as claimed in one of the preceding claims, characterized in that the outflow characteristic can be set to scatter character when there is a second
30 deviation of the actual value from a setpoint value.

10. The heating, ventilating or air-conditioning system as claimed in one of the preceding claims, characterized in that the outflow characteristic can be
35 set to an intermediate position between the spot character and scatter character for actual values between the first and second setpoint values.

11. The heating, ventilating or air-conditioning system as claimed in one of the preceding claims, characterized in that in the case of the spot character the quantity of air which can flow out is maximized.

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12. The heating, ventilating or air-conditioning system as claimed in one of the preceding claims, characterized in that in the case of the scatter character the quantity of air which can flow out is reduced compared to the maximum value.

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13. The heating, ventilating or air-conditioning system as claimed in one of the preceding claims, characterized in that the at least one air outflow vent is a footwell air outflow vent, a ventilation air outflow vent, a defrosting air outflow vent or a side air outflow vent.

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14. The heating, ventilating or air-conditioning system as claimed in one of the preceding claims, characterized in that the at least one air outflow vent is arranged in the trim areas or pillar areas of the passenger compartment of the vehicle.

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15. A method for controlling a heating, ventilating or air-conditioning system having at least one sensor for sensing the at least one actual value and an open-loop control system for determining and comparing the at least actual value with at least one setpoint value and for actuating an actuator element of an outflow vent for actuating or setting the characteristic of at least one outflow vent, in particular according to one of the preceding claims.

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16. The method for controlling a heating, ventilating or air-conditioning system as claimed in one of claims 1 to 14, the outflow characteristic and/or the outflow setting of the at least one air outflow vent

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being open-loop controlled or closed-loop controlled as a function of at least one parameter P.

17. The method for controlling a heating, ventilating
5 or air-conditioning system as claimed in claim 16,
characterized in that the outflow characteristic and/or
the outflow setting of the at least one air outflow
vent are open-loop controlled or closed-loop controlled
as a function of the deviation of an actual value from
10 a setpoint value.

18. The method as claimed in one of claims 16 or 17,
characterized in that the outflow characteristic of the
at least one air outflow vent is changed according to a
15 chronologically predetermined profile.

19. The method as claimed in one of claims 16 to 18,
characterized in that the outflow characteristic and/or
the outflow setting of the outflow vent is kept
20 constant at a first outflow characteristic and/or first
outflow setting as a function of the at least one
parameter P starting from its initial value P0 until a
parameter value P1 is reached, and after the parameter
value P1 is reached it is changed automatically in a
25 continuous fashion or in discrete increments up to a
second outflow characteristic and/or outflow setting
until a parameter value P2 is reached.

20. The method as claimed in one of claims 16 to 19,
30 characterized in that, after the parameter value P2 is
reached, the outflow setting of the outflow vent is
changed automatically in a continuous fashion or in
discrete increments up to a third outflow setting until
the parameter value P3 is reached, in particular is
35 reduced to a predetermined value, the outflow
characteristic being kept constant.

21. The method as claimed in one of claims 16 to 20, characterized in that the at least one parameter P is a temperature parameter and/or a time parameter.

5 22. The method as claimed in claim 21, characterized in that the temperature parameter is the passenger compartment air temperature, external air temperature and/or air outlet temperature.

10 23. The method as claimed in one of claims 16 to 22, characterized in that the first outflow characteristic corresponds to an essentially directed outflow or spot flow.

15 24. The method as claimed in one of claims 16 to 23, characterized in that the second outflow characteristic corresponds to an essentially diffuse outflow.

20 25. The method as claimed in one of claims 16 to 24, characterized in that a time T0 for the start of the sequence of the method is defined by switching on the heating, ventilating or air-conditioning system or by activating the motor vehicle. At the time T0, there must be sufficient heating power available to permit
25 targeted, punctual heating.

26. The method as claimed in one of claims 16 to 25, characterized in that the parameter values P1, P2 and/or P3 are defined as a function of a characteristic
30 diagram.